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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,189	06/20/2002	Jiang Hsieh	112027	2801

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EXAMINER

HO, ALLEN C

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/064,189	HSIEH ET AL.	
	Examiner	Art Unit	
	Allen C. Ho	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-10 is/are allowed.
- 6) ☒ Claim(s) 1,2,4,11,13,14 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 3, 5-7, 12, 15-17 and 21-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>0902</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Fig. 8 is objected to because reference 98 should be pointed at the radiation source center. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 8 is objected to because of the following informalities: line 7, --source-- should be inserted before "current". Appropriate correction is required.
3. Claim 18 is objected to because of the following informalities: line 8, --array-- should be inserted after "detector". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Reuveni (U.S. Patent No. 4,682,291).

With regard to claim 1, Reuveni disclosed a method for operating a radiation source, the method comprising: providing a radiation source (12); providing a detector (16); and operating the radiation source and the detector such that the detector receives a substantially homogeneous (uniform) noise distribution.

With regard to claim 11, Reuveni disclosed a computer (inherent in a computed tomography system) operating a radiation source installed on a scanning imaging system (11), wherein the imaging system comprises a radiation source (12) and a detector (16), the computer programmed to operate the radiation source and the detector such that the detector receives a substantially homogeneous (uniform) noise distribution.

6. Claims 1, 4, 11, 14, 18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueda *et al.* (U. S. Patent No. 5,396,889).

Applicant disclosed that a pre-patient filter (90), thicker at the center and thinner near the edge, produces homogeneous noise distribution (paragraph [0027]).

With regard to claim 1, Ueda *et al.* Disclosed a method for operating a radiation source, the method comprising: providing a radiation source (1); providing a detector (11); and operating the radiation source and the detector such that the detector receives a substantially homogeneous noise distribution (column 4, lines 50-51).

With regard to claim 4, Ueda *et al.* disclosed a method in accordance with claim 1, further comprising installing a filter (3) between the radiation source and an object (10) of interest such that an x-ray flux (15) delivered to a plurality of regions in a field of view is approximately homogenous.

With regard to claim 11, Ueda *et al.* disclosed a computer (12) operating a radiation source installed on a scanning imaging system, wherein the imaging system comprises a radiation source (1) and a detector (11), the computer programmed to operate the radiation source and the detector such that detector receives a substantially homogenous noise distribution (column 4, lines 50-51).

With regard to claim 14, Ueda *et al.* disclosed a computer in accordance with claim 11, further programmed to operate the imaging system, wherein the imaging system further comprises a filter (3) installed between the radiation source and an object (10) of interest such that an x-ray flux (15) delivered to a plurality of regions in a field of view is approximately homogenous.

With regard to claim 18, Ueda *et al.* disclosed a computed tomographic (CT) imaging system comprising: a radiation source (1); a detector array (11); and a computer (12) coupled to the detector array and the radiation source, the computer configured to operate the radiation source such that at least one of an inverted cone beam and a non-inverted cone beam geometry is received by the detector array.

With regard to claim 20, Ueda *et al.* disclosed a CT system in accordance with claim 18, wherein the CT imaging system further comprises a filter (3) installed between the radiation source and an object (10) of interest such that an x-ray flux (15) delivered to a plurality of regions in a field of view is approximately homogenous.

7. Claims 18 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Mihara (U. S. Patent No. 5,805,663).

With respect to claim 18, Mihara disclosed a computed tomographic (CT) imaging system for operating a radiation source, the CT system comprising: a radiation source (101); a detector array (102); and a computer (105) coupled to the detector array and the radiation source, the computer configured to operate the radiation source such that at least one of an inverted cone beam geometry (Fig. 8) and a non-inverted cone beam geometry is received by the detector array.

With regard to claim 19, Mihara disclosed a CT system in accordance with claim 18, wherein the radiation source comprises at least one of a line radiation source (Fig. 3B) and a two-dimensional radiation source (Fig. 3C).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reuveni (U. S. Patent No. 4,682,291) as applied to claims 1 and 11 above, and further in view of Hu (U. S. Patent No. 5,663,995).

With regard to claims 2 and 13, Reuveni disclosed a method and a computer in accordance with claims 1 and 11.

However, Reuveni disclosed a radiation source that produces a fan beam instead of a cone beam.

Hu taught that a cone beam system provides faster patient exam speed (column 1, lines 60-67; column 2, lines 3).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to replace the fan beam geometry with a cone beam geometry, since a person would be motivated to expedite scanning in order to reduce radiation dose received by the patient.

Allowable Subject Matter

10. Claims 3, 5-7, 12, 15-17, and 21-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 3 and 12, the prior art fails to teach or fairly suggest that the radiation source comprises at least one of a line radiation source and a two-dimensional radiation source, as claimed in claims 3 and 12.

With regard to claims 5, 15, and 21, the prior art fails to teach or fairly suggest modulating a radiation source current such that the radiation source current near an edge of the radiation source is greater than the radiation current at a center of the radiation source, as claimed in claims 5, 15, and 21.

With regard to claims 6, 16, and 22, the prior art fails to teach modulating a dwell time of an electron beam emitted from the radiation source such that a dwell time at an x-ray spot near

an edge of the field of view is greater than the dwell time at an x-ray spot near a center of the field of view, as claimed in claims 6, 16, and 22.

With regard to claims 7, 17, and 23, the prior art fails to teach or fairly suggest modifying a sampling distance between a plurality of x-ray spots such that the spots near an edge of the radiation source are spaced closer than spots near a center of the radiation source, as claimed in claims 7, 17, and 23.

12. Claims 8-10 are allowed.

13. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 8-10, the prior art fails to teach or fairly suggest a method for operating a radiation source on a scanning imaging system, comprising the steps of: modulating the radiation current such that the radiation source current near an edge of the radiation source is greater than the radiation source current at a center of the radiation source; and modulating a dwell time of an electron beam emitted from the radiation source such that a dwell time at an x-ray spot near an edge of the field of view is greater than the dwell time at an x-ray spot near the center of the field of view, as claimed in claim 8.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Whitlock *et al.* (U. S. Patent No. 6,333,968 B1) disclosed a two-dimensional radiation source.
- (2) Toth (U. S. Patent No. 6,280,084 B1) disclosed a pre-object filter.

(3) Molloi *et al.* (U. S. Patent No. 5,778,046) disclosed an adjustable pre-object filter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (703) 308-6189. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (703) 308-4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.



Allen C. Ho
Patent Examiner
Art Unit 2882

ACH